

**CLAIMS**

We claim:

1. A method for processing a protein-containing material comprising the following step:
  - 5 contacting reactants and creating a reaction mix for a period of less than six hours;  
wherein the reactants comprise an animal-derived protein-containing material and an alkaline material;
  - 10 wherein at least some of the protein is hydrolyzed into a mixture of peptones;  
wherein the mixture of peptones has a molecular weight distribution such that at least a portion of the peptones have no more than three amino acid mers.
- 15 2. The method described in claim 1 wherein the protein-containing material comprises feathers.
3. The method described in claim 2, wherein the feathers comprise poultry feathers.
4. The method described in claim 3, wherein the poultry feathers comprise 20 turkey feathers.
5. The method described in claim 1 wherein the alkaline material comprises sodium hydroxide.
6. The method described in claim 1, wherein the pH of the reaction mix is 8 or higher.
- 25 7. The method described in claim 1, wherein the temperature of the reaction mix is above 90 deg C.
8. The method described in claim 2, wherein the feathers comprise poultry offal.

9. A method for processing a protein-containing material comprising the following step:

contacting reactants and creating a reaction mix for a period of less than six hours,;

5 wherein the reactants comprise turkey feathers and sodium hydroxide;

wherein the temperature of the reaction mix is above 90 deg C;

wherein at least some of the turkey feather is hydrolyzed into a mixture of peptones;

wherein the mixture of peptones has a molecular weight distribution such

10 that at least a portion of the peptones have no more than three amino acid mers.

10. A method for making peptones comprising the following step:

contacting reactants and creating a reaction mix for a period of less than six hours,;

15 wherein the reactants comprise an animal-derived protein-containing material and an alkaline material;

wherein at least some of the protein is hydrolyzed into a mixture of peptones;

wherein the mixture of peptones has a molecular weight distribution such

20 that at least a portion of the peptones have no more than three amino acid mers.

11. The method described in claim 10, wherein the protein-containing material comprises feathers.

12. The method described in claim 11, wherein the feathers comprise poultry feathers.

25 13. The method described in claim 12, wherein the poultry feathers comprise turkey feathers.

14. The method described in claim 10 wherein the alkaline material comprises sodium hydroxide.
15. The method described in claim 10, wherein the pH of the reaction mix is 8 or higher.
- 5 16. The method described in claim 10, wherein the temperature of the reaction mix is above 90 deg C.
17. The method described in claim 10, wherein the protein-containing material comprises offal.
18. A method for making peptones comprising the following step:
  - 10 contacting reactants and creating a reaction mix for a period of less than six hours,; wherein the reactants comprise turkey feathers and sodium hydroxide; wherein the temperature of the reaction mix is above 90 deg C; wherein at least some of the turkey feather is hydrolyzed into a mixture of 15 peptones; wherein the mixture of peptones has a molecular weight distribution such that at least a portion of the peptones have no more than three amino acid mers.
19. A method for processing a protein-containing material comprising the 20 following step:
  - 25 contacting reactants and creating a reaction mix for a period of less than six hours; wherein the reactants comprise an animal-derived protein-containing material and an alkaline material; wherein at least some of the protein is hydrolyzed into a mixture of peptones; wherein the mixture of peptones has a solubility in water of at least 0.01915 gm/ml.

20. A method for processing a protein-containing material comprising the following steps:

contacting reactants and creating a reaction mix;

wherein the reactants comprise an animal-derived protein-containing material and an alkaline material;

5 wherein at least some of the protein is hydrolyzed into a mixture of peptones;

separating at least some of the peptones by molecular weight;

drying the separated peptones;

10 wherein the dried peptones have a dry whiteness of L exceeding 75.

21. The mixture of peptones resulting from the method described by claim 1.

22. The mixture of peptones resulting from the method described by claim 9.

23. The peptones made by the method described by claim 10.

24. The peptones made by the method described by claim 18.

15 25. A method for processing poultry waste material comprising the following steps:

contacting reactants and creating a reaction mix for less than six hours,

wherein the reactants comprise a turkey waste material and an alkaline material, and wherein a reaction product is obtained which 20 comprises peptones; and

separating the reaction product to obtain a mixture of peptones for which substantially all of the peptones have a molecular weight of at least about 1,000 Daltons.

26. The method of claim 25, wherein the poultry waste material is selected 25 from the group consisting of feathers, offal, and combinations thereof.

27. The method of claim 25 wherein the poultry waste material is feathers.

28. The method of claim 25, wherein the poultry waste material is offal.

29. The method of claim 25, wherein there is an additional step of separating the reaction product by filtration.

30. The method of claim 29, wherein the filtration comprises:  
5 passing the reaction product through a membrane filter having a pore size ranging from about 10 Angstroms to about 50 Angstroms resulting in a permeate and a concentrate.

31. The method of claim 29, wherein the filtration comprises:  
passing the reaction product through a filter having a pore size ranging from about 0.2 microns to about 5 microns; and subsequently  
10 passing the remaining reaction product through a membrane filter having a pore size ranging from about 10 Angstroms to about 50 Angstroms.

32. The method of claim 30, wherein the mixture of peptones in the concentrate has a molecular weight distribution for which at least about 75% of the peptones have a molecular weight between about 1,000 Daltons and about 6,000 Daltons.

15 33. The method of claim 25, wherein the mixture of peptones has a solubility in water of at least about 0.05 gm/ml.

34. The method of claim 25, wherein the pH of the reaction mix is about 8 or higher.

35. The method of claim 25, wherein the temperature of the reaction mix is  
20 above about 90 degrees C.

36. The method of claim 25, wherein during the purifying of the reaction product, an additional mixture of peptones is obtained for which substantially all of the peptones have a molecular weight of less than about 1,000 Daltons.

37. A mixture of peptones resulting from a method for processing turkey waste  
25 material which comprises the following steps:  
contacting reactants and creating a reaction mix for less than six hours, wherein the reactants comprise the turkey waste material and an alkaline material, and wherein a reaction product is obtained which comprises peptones; and

separating the reaction product to obtain a mixture of peptones for which substantially all of the peptones have a molecular weight of at least about 1,000 Daltons.

38. A peptone concentrate resulting from a method for processing turkey waste material which comprises the following steps:

5 providing a quantity of turkey waste material;

mechanically breaking the turkey waste material into smaller pieces;

contacting the resultant turkey waste material pieces with an alkaline solution to produce a reaction mix, wherein the temperature of the

10 reaction mix is above about 90 deg C;

holding the turkey waste material pieces in the reaction mix for a period of time sufficient to produce peptones, wherein a predominance of the peptones have a molecular weight less than about a pre-determined number of Daltons;

15 cooling the reaction mix;

neutralizing the reaction mix;

pre-filtering the reaction mix to remove large impurities;

filtering the remaining reaction mix to obtain a peptone concentrate for

20 which substantially all of the peptones have a molecular weight of at least about 1,000 Daltons;

spray drying the peptone concentrate; and

collecting the peptone concentrate.

39. An ingredient for use in pet foods comprising, a peptone concentrate produced by the method of claim 38.

25 40. A fertilizer comprising, a peptone concentrate produced by the method of claim 38.

41. The fertilizer of claim 40, wherein the alkaline solution is potassium hydroxide and the reaction mix is neutralized with phosphoric acid.